

3.0 SITE SPECIFIC RISK-BASED END STATE DESCRIPTION

3.1 PHYSICAL AND SURFACE INTERFACE

The FCP site is a 1050-acre facility located in southwestern Ohio, about 18 miles northwest of downtown Cincinnati. The facility is located just north of the small rural community of Fernald and lies on the boundary between Hamilton and Butler counties (See Figure 3.1b).

The FCP currently has approximately 400 of the 1050 acres disturbed due to ongoing remediation work. The Former Production Area, Waste Pit Area, Silos Area, OSDF, and Borrow Area are all in a condition of surface disturbance due to soil excavation, disposal or other construction activities. Infrastructure for the Aquifer Restoration Project (e.g., wells, pump houses) is visible in much of the southern perimeter area of the FCP and off-site areas south of the FCP. The majority of the perimeter areas of the FCP are either former pastures, woodlots or stream corridors that have been restored to the early stages of prairie or woodlot or are in the process of being restored to natural areas.

The RBES of the FCP site will be an Undeveloped Park with limited public access for educational purposes. The FCP site will remain under federal ownership. The OSDF and buffer zone will remain DOE property in perpetuity to allow DOE to continuously monitor and maintain the facility. In the event that DOE transfers management of the OSDF to another federal government entity, the appropriate restrictions and limitations will be communicated and implemented (e.g., deed restrictions).

The land immediately adjacent to the FCP site is privately owned for agricultural, residential, and commercial use. According to the Butler and Hamilton Counties projected future land use, the land will remain privately owned for agricultural, residential, and commercial use. All of the land that borders the southern perimeter of the FCP and almost half of the land that borders the eastern perimeter of the FCP is owned and farmed by one family. Indications are that this property will remain as agricultural land with the currently family continuing to live on and farm the property. The remainder of the property that borders the eastern perimeter of the FCP is privately owned, agricultural land and will likely remain as such. The majority of the land that borders that northern perimeter of the FCP is owned by a single land-owner who lives and farms the property. There is no indication at this time that this property will be sold or developed. The western perimeter of the FCP is bordered by a series of private residences, businesses or agricultural land. One private residence is being sold as commercial property at this time. There is the potential that additional private residences or agricultural land will be developed over the next decade.

Access to the site will be available by the North and South Access Roads. The North Access Road will be accessible by State Route 126 that runs along the northeast corner of the FCP site. The South Access Road will be accessible by Willey Road that runs along the southern property boundary and intersects State Route 128 to the east of the site. The access road around the OSDF will be left to provide access for inspection and maintenance during Legacy Management.

Activities conducted to support the original site mission have significantly altered the topography of the FCP site. The end state of the site will be mainly forest (395 acres) and prairie (327 acres). The OSDF and buffer zone will cover approximately 75 acres, wetlands will cover approximately 81 acres, and lakes will cover approximately 60.4 acres.

Paddys Run flows from north to south along the FCP's western boundary and empties into the Great Miami River approximately 1.5 miles south of the site. Paddys Run is an ungaged, intermittent stream that flows primarily between January and May with an estimated discharge of 0.2 to 4 cubic feet per second (cfs).

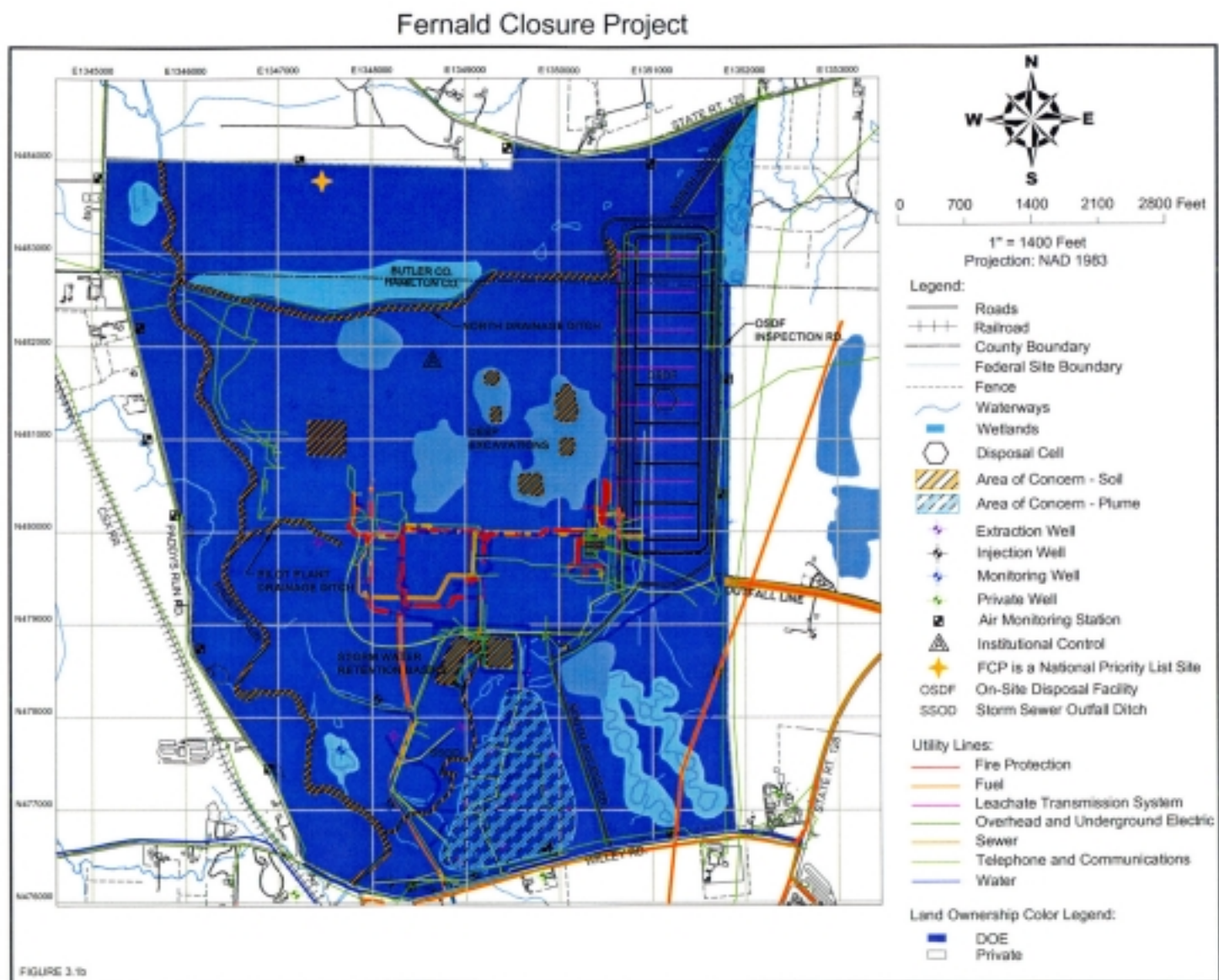


Figure 3.1b. Site physical and surface interface –RBES.

3.2 HUMAN AND ECOLOGICAL LAND USE

Risk to ecological receptors is being considered as part of the remediation of the FCP. Ecological risks were first addressed through the Sitewide Ecological Risk Assessment (SERA), which was conducted as part of the Operable Unit (OU) 5 Remedial Investigation (DOE, 1995a). The SERA assessed both radiological and non-radiological risks. Dose estimates to receptor organisms demonstrated that there was no ecological risk due to effects from radiation at the Fernald site. For non-radiological risks, contaminant concentrations were compared to media-specific benchmark toxicity values (BTVs). BTVs are not cleanup levels, but rather literature-derived concentrations that are considered protective of ecological receptors. Based on this review, several contaminants warranted further investigation. Further studies were deferred until human health-driven remedial activities were better defined.

Non-radiological ecological risks were subsequently re-evaluated as part of the Sitewide Excavation Plan (SEP). Updated site soil data, background concentrations, human health Final Remediation Levels (FRLs), and remediation footprints were again compared to BTVs. These exercises revealed that remedial activities should address most potential risks to ecological receptors. However, several constituents that exceed BTVs may remain following soil excavation. In these instances, constituents of ecological concern (COECs) have been included as part of the soil certification process. Certification data are compared to corresponding BTVs in order to determine if additional investigation is necessary. To date, remedial activities have addressed all ecological concerns, as no certification data have exceeded soil BTVs.

Several surface water and sediment BTV exceedances were documented on and off property in the SERA. Like soil, these potential risks were re-evaluated as part of the SEP. Surface water would include both on-property locations such as Paddys Run and the Great Miami River off-property. Surface water and sediment BTVs were compared against background concentrations and human health FRLs. Again, like soil, this process revealed that human health-driven remedial activities would address the majority of potential risks to ecological receptors. Remaining COECs were included in the Integrated Environmental Monitoring Plan (IEMP) surface water and sediment sampling program. Since its inception, IEMP surface water sampling has resulted in only a few sporadic BTV exceedances. DOE has since gained approval to eliminate most BTV-driven surface water sampling, although data collected for other purposes will continue to be reviewed to ensure protectiveness of ecological receptors. Sediment COECs will be handled similar to the approach for soil COECs, as they will be included in the certification sampling program following stream corridor remediation efforts.

The SEP evaluation also investigated the potential for post-remediation soil concentrations to contaminate surface water and sediment. Soil COECs were evaluated using the site Surface Water Flow and Infiltration Model. Maximum anticipated post-excavation soil concentrations were established for each drainage sub-basin recognized by the model. When a soil concentration was not available, background concentrations were used. The results of this effort revealed that no cross media impacts would be a concern.

During the solicitation of community input for the remedy decisions, it became clear that virtually no Stakeholders or members of the public were interested in seeing the on-site area of Fernald returned to an unrestricted residential/farming land use following remediation. Therefore, the final RBES land use of the FCP site will be an Undeveloped Park with limited public access for educational purposes with the goal to educate the public about regional environmental, cultural, historical, and ecological issues (See Figure 3.2b). Approximately 900 acres of the site's ecological natural resources will be restored. The restored habitat types will include upland forest, riparian forest, tall grass prairie, wetlands, and open water. Wetlands cover approximately 81 acres of the site. Deep excavations in the former production

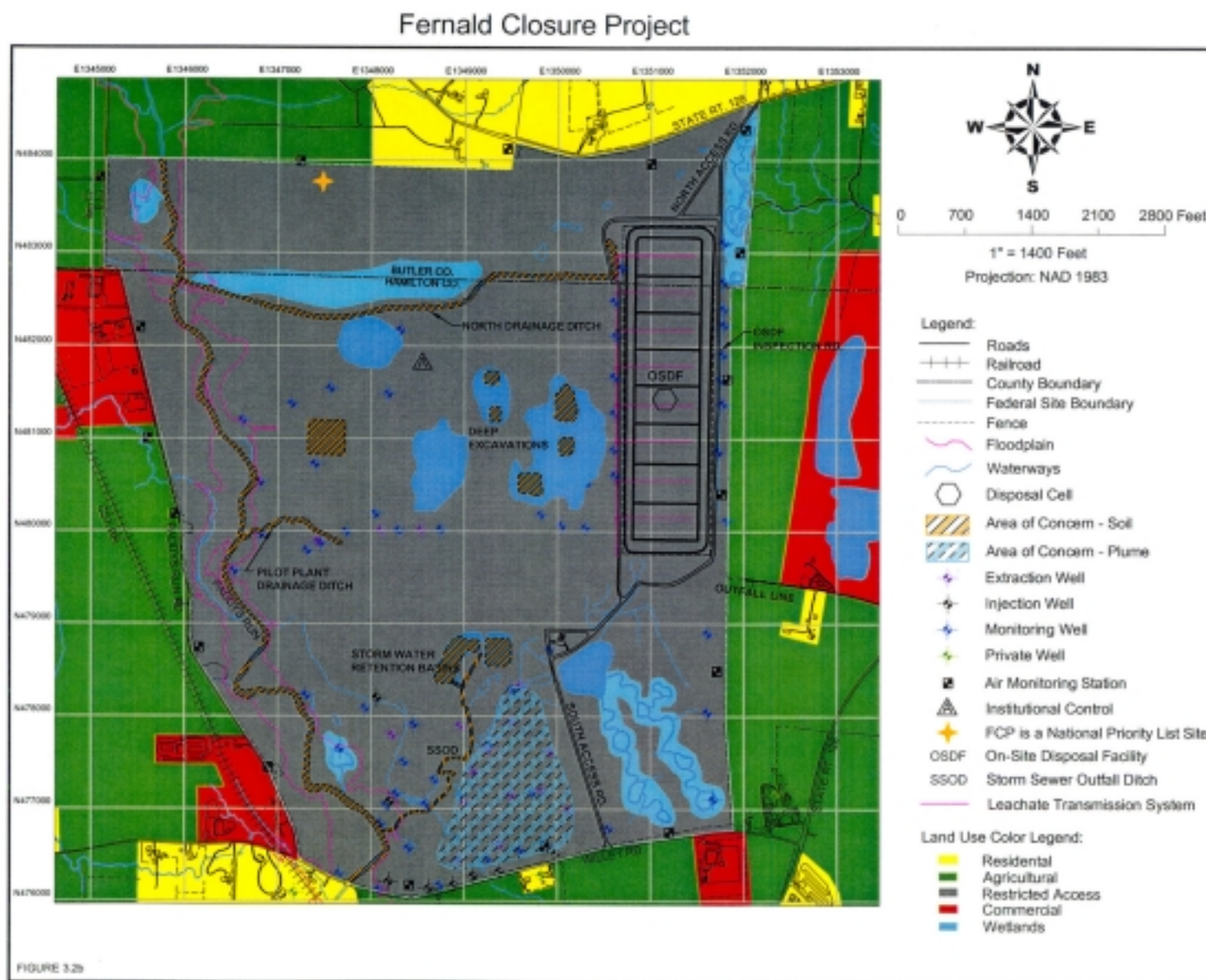


Figure 3.2b. Site human and ecological land use – RBES.

area will be converted to ponds. Restoration of the site will begin with grading for stability, erosion control, and to establish proper drainage patterns. The revegetation of the site will occur through the installation of native species of saplings, shrubs, or seedlings in designated areas. Other areas of the site will be seeded using native prairie grasses. The Paddys Run corridor represents excellent habitat for the federally endangered Indiana bat and the state threatened Sloan's crayfish inhabits portions of the creek. The riparian corridor along Paddys Run will be enhanced through the Restoration efforts described below.

The FCP site is situated over the Great Miami Aquifer, which is a sole-source aquifer that generally flows from west to east, with a component of the flow directed towards the south. Approximately 179 acres of on-site and off-site portions of the Great Miami Aquifer have been contaminated by FCP site mission activities. The contaminated groundwater will be extracted, treated/processed, blended with untreated storm water and remediation wastewater, and discharged to the Great Miami River as necessary to restore the Great Miami Aquifer to full beneficial use.

3.3 SITE CONTEXT LEGAL OWNERSHIP

The FCP site will remain under federal ownership with limited public access for educational purposes. The OSDF and buffer zone will remain DOE property in perpetuity to allow DOE to continuously monitor and maintain the facility. In the event that DOE transfers management of the OSDF to another federal government entity, the appropriate restrictions and limitations will be communicated and implemented (e.g., deed restrictions).

The land immediately adjacent to the FCP site is privately owned for agricultural, residential, and commercial use. According to the Butler and Hamilton Counties projected future land use, the land will remain privately owned for agricultural, residential, and commercial use (See Figure 3.3b).

3.4 SITE CONTEXT DEMOGRAPHICS

The final land use of the FCP site will be an Undeveloped Park with limited public access; therefore, there will be no residential use of the site.

The land immediately adjacent to the site is sparsely populated and primarily used for agricultural and commercial purposes. The population density around the FCP site is projected to be less than 10 people per square mile (See Figure 3.4b).

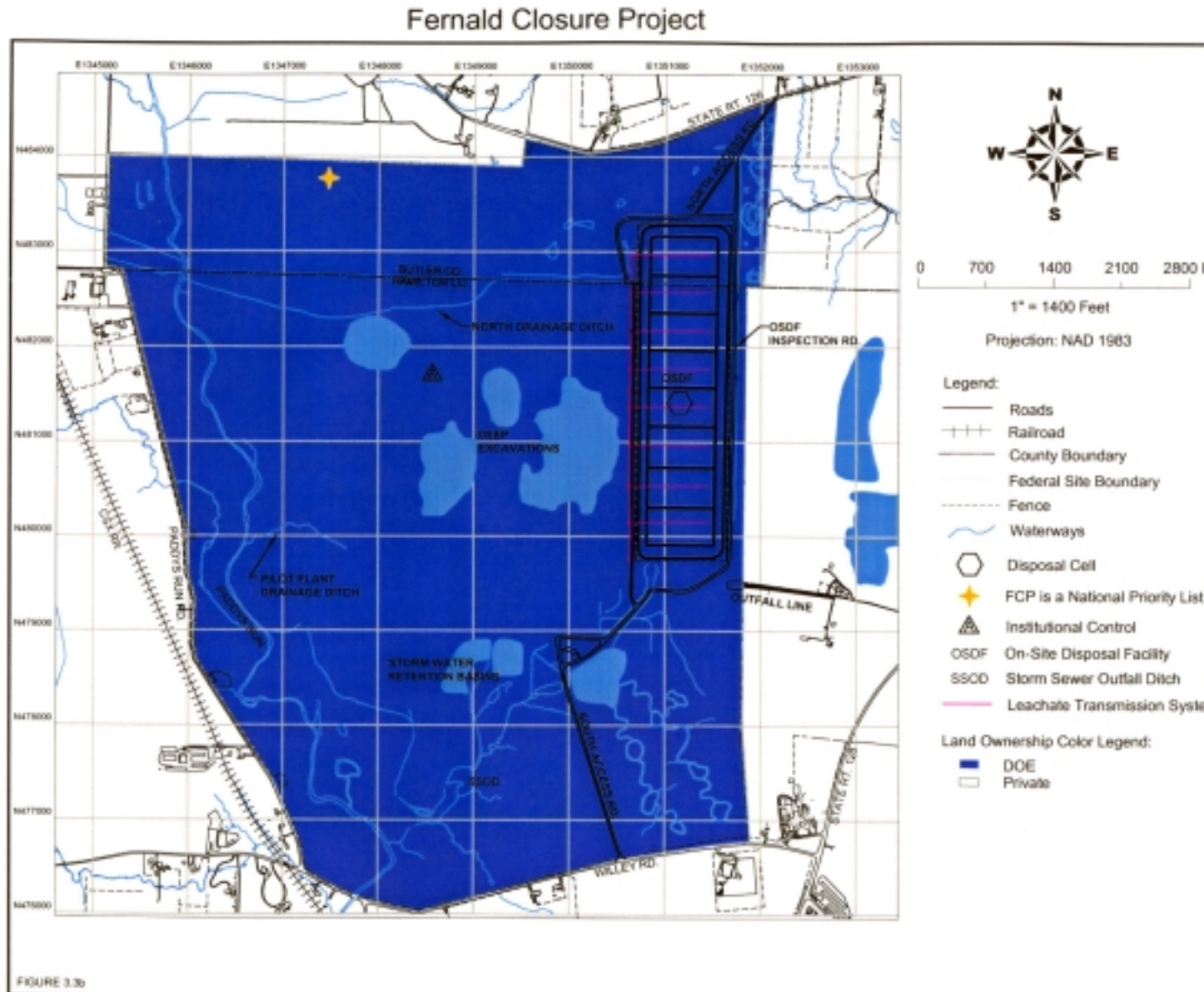


Figure 3.3b. Site legal ownership – RBES.

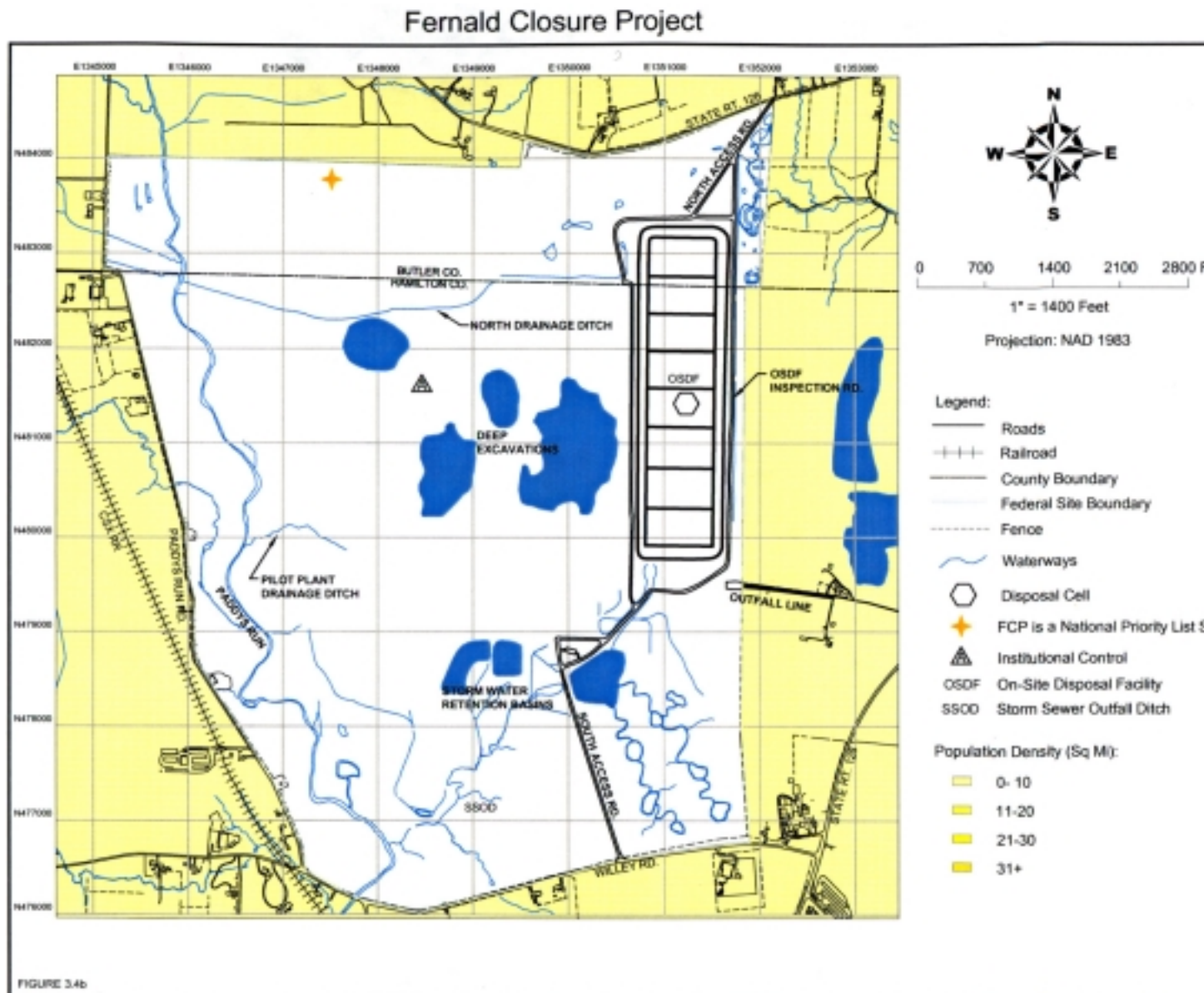


Figure 3.4b. Site context demographics map – RBES.